

SARTECH II Test Study Guide

There are two parts to the NASAR SARTECH exam, a written test and a field test. The written part of the SARTECH Exam consists of 150 questions.

This study guide contains the concepts from the original NASAR SAR Technician II source document. Originally Kenneth Laidlaw, a SAR Technician II Evaluator, added key words for each concept. NASAR textbook. Then, Mark Mihaljevich of Rogue Valley SAR, expanded the concepts to include the Incident Command System subject matter and expanded the comments with a more comprehensive statement. The 150 questions for the SAR Tech II certification test are drawn from these concepts. NASAR publishes a textbook, Fundamentals of Search and Rescue, Second Edition. This book includes these concepts and many more and is available from the NASAR bookstore. It can be ordered by phone at 703-222-6277 or on their website at www.nasar.org.

The practical or field part of the SARTECH II exam consists of six "Performance Evaluation Stations." These stations include: Land Navigation, Tracking, 24-Hour Pack, Rope Skills, Patient Transportation, and Search Techniques. Applicants must perform these skills in the presence of an evaluator. Each performance skill has specific requirements and a well-defined criteria for either a pass or failing score. A student who fails at a station may repeat that station, once, on the same day. Applicants who fail either the exam or practical

Concepts and comments:

1. Search

An event or mission that includes an investigation of and the location of a missing person(s)

2. Rescue

The procedure of rescuing a victim:

3. What does LAST stand for

Locate, Access, Stabilize and Transport

4. Preplanning

The overall planning that occurs before an incident

5. Notification

The first time that an incident is made known to SAR personnel.

6. Planning and Strategy

The stage where the details are developed regarding how an incident will be managed

7. Tactics and Operations

The stage of an incident where the plans are implemented and physically carried out in the field

8. Suspension
The decision to end a mission, either when the subject(s) has been found or when a determination has been made to end the mission
9. Critique
An evaluation of the mission to look for ways to improve in the future
10. U.S. Air Force
Responsible for all land areas
11. U.S. Coast Guard
Responsible for all maritime areas
12. 12 Air Force Coordination Center
Does coordination only
13. Federal Aviation Administration
Responsible for aircraft incidents and ELT's
14. Civilian Air Patrol
Civilian assistance for aircraft
15. State SAR authorities
Responsible for coordination and legislation
16. Local SAR authorities
Responsible for the initial response to an incident
17. List the 6 expected qualities of a SAR responder:
PHACKS—To be Proficient, Humble, Able, Competent, Knowledgeable and Solicitous
18. Name the four parts of physical conditioning for the SAR responder
SAFE—Strength, Agility, Flexibility and Endurance
19. What are limitations of any SAR person or SAR team
You or the team is only as strong as the weakest link
20. What are the four essential requirements of an Incident Command System?
**a) Must be flexible,
b) Agencies must be able to use the ICS for routine situations and major emergencies,
c) Must be standard to allow personnel from different agencies and areas to work together,
d) Must be cost effective**
21. What does ICS stand for?
Incident Command System
22. Common Terminology
Everyone in the ICS using the same terminology, clear text)

23. Modular Organization
Made up of different components or modules to allow for flexibility and expansion of functions
24. Integrated Communications
Refers to the ability to communicate easily throughout the ICS system
25. Unified Command Structure
Defines who is in charge of the different components of ICS
26. Consolidated Action Plans
The plan that is made up for each operational period
27. Management Span of Control
Referring to how many organizational elements can be directly managed by another person. The span of control is usually five or less
28. Predesignated Incident Facilities
Referring to the physical facilities to be used on a mission: base camp, command post, etc.
29. Comprehensive Resource Management
The management in the ICS of the different SAR positions: single person, Strike Team, Task Force, Incident Commander, etc.
30. Command
Has overall responsibility of the incident.
31. Operations
Conducts the actual operation for carrying out the plan.
32. Planning
Develops the action plan to accomplish the objectives.
33. Logistics
Provides support and resources.
34. Finance
Monitors cost of the incident and provides accounting.
35. What are the three status conditions of all resources of an incident?
They are either:
 - a) **Assigned,**
 - b) **Available**
 - c) **Out of Service**
36. List and prioritize the Necessities of Life:
In the following order—Positive mental attitude, Air, Shelter, Rest, Signals, Water, and Food.
37. What are the four parts of an Initial Response to a life-threatening situation?
 - a) **Alarm,**

- b) Reaction,
- c) Response,
- d) Rest *(No Page)*

38. Define a Comfort Zone Expander (to increase one's ability to react positively to stress)
A person who seeks to develop the ability to expand their mental abilities beyond their normal comfort zone. Such a person develops the ability to react positively and directly in stressful or emergency situations
39. List at least five ways for a person to control fear
- a) Recognize fear and accept it,
 - b) Take positive action to take control of the situation,
 - c) Be prepared by hoping for the best but planning for the worst,
 - d) Set realistic goals,
 - e) Utilize teamwork,
 - f) Make use of your spiritual faith, etc.
40. Describe the "STOP" survival plan
- S - Stop: Stop at the first sign of trouble**
 - T - Think: Think about immediate & future dangers and analyze your entire situation.**
 - O - Observe: Look around and size up your situation.**
 - P - Plan: Plan the best course of action before taking any action. Be practical & deliberate**
41. Define "positive mental attitude."
A state of mind that is based on one's ability in choosing to be positive. Examples: I choose to have self-confidence, I set realistic goals, I make positive decisions and choices, etc.
42. What is considered a short-term survival situation vs a long-term survival situation?
A situation that is anything under 72 hours
43. What is defensive living?
The constant conscious thought process and behavior of an individual to predict situations that will affect her or her comfort or existence
44. List three situations commonly encountered on SAR missions that may lead to a survival situation.
- a) Change in temperature,
 - b) Lack of rest,
 - c) Lack of food or water,
 - d) Lack of proper clothing or shelter, etc.
45. Describe how in each of the following processes of how the human body loses heat:
- a) Radiation: the body loses heat directly into the air
 - b) Conduction: loss of body heat by having contact with something colder than the body temperature

- c) Convection: loss of heat from air currents blowing the radiated heat away from the body faster than can be produced**
- d) Evaporation: Heat is lost through the evaporation process: sweating**
- e) Respiration: Breathing out warmed air**

- 46. Describe the heat production and heat loss balance equation of the human body**
Heat production and heat loss can be seen as an equation that must be balanced if a comfortable state is to be maintained. For example, when you have heat loss and experience cold, you need to take action to balance this "equation" by increasing heat production or by cutting down on heat loss
- 47. Describe the basic water and chemical needs of the human body**
2/3 of the body's weight is water. A 1% loss of water results in feeling thirsty. A 10% water level drop results in mental deficiencies. A 20% loss usually results in death. Salt & calcium are two chemicals that are also crucial for the human body
- 48. What are the average daily food requirements of the human body?**
Needs about 1400—2000 calories, the average SAR worker requires about 3800 calories
- 49. List at least three similarities or differences and at least three advantages or disadvantages of the natural and synthetic materials used for SAR clothing**
Cotton can be good in moderate climates but only while it remains dry. It retains moisture, dries slowly and wicks water rapidly from damp or wet areas to dry areas, etc. Wool, another nature fiber, is better than other natural fibers because of it's ability to insulate when wet. It also exhibits little wicking action and has some ability to repel water. Silk is recognized for it's value in cold weather. It is light, strong, is a good insulator and wicks water away from the skin.
In the synthetic fibers, nylon has good strength, washes & dries easily but has very low moisture absorption causing perspiration to stay on the surface causing dampness. Polypropylene is a very good material because it dries quickly, will not absorb water and wicks moisture away from the body. It also has a very low density & floats. Drawbacks of polypropylene are that it has poor resistance to melting and has a tendency to retain odors
- 50. List at least three factors concerning heat transfer of clothing due to its construction or design**
a) Wind blockage: Wind can cause loss of heat by convection. A wind breaking material such as Nylon or GorTex will prevent this.
b) Heat retention: Heat is retained in materials that have "dead air spaces such as PolarGuard, and Quallofil.
c) Moisture control: Moisture is best controlled by materials such as Polypropylene that wick moisture away from the skin
- 51. Underwear Layer**
Allows radiated heat and moisture through.

52. Clothing Layer
Provides a dead air space.
53. Insulation Layer
Provides for heat retention.
54. Shell Layer
Stop heat transfer and protects from the elements.
55. Describe the advantages and disadvantages of the use of vapor barriers
In extreme cold temperatures a vapor barrier will prevent heat loss by evaporation. However, the use of a vapor barrier can be detrimental if used when the temperature of actions of the wearer cause heavy perspiration to condense under the barrier. This can reduce the insulation value of garments and increase heat loss by convection. Using a vapor barrier may be used when a person is cold and sleeping
56. Describe the advantages or disadvantages of the use of constriction outdoor clothing
Constrictive clothing should be avoided as it can cause a problem by impeding the flow of blood to the extremities. The result can be cold injuries such as frost bite
57. What is the most important factor in choosing footwear?
That it fit properly
58. What are three basic considerations when building a shelter?
 - a) Location,
 - b) Insulation sources,
 - c) Water and fuel sources,**In addition, shelters should be small, dry and well insulated**
59. What do all fires need?
 - a) Heat,
 - b) Fuel
 - c) Oxygen
60. List at least three basic considerations when building a fire
 - a) Location,
 - b) Fuel sources,
 - c) Starting mechanism
61. List at least three ways to make a signal
Fire, smoke, light, mirror, movement, anything out of place, etc.
62. List at least two ways to purify water
 - a) Boiling for at least five minutes,
 - b) Use 2% iodine, or use eight drops of chlorine bleach per gallon of water,
 - c) Filter, 0.1 microns
63. List two ways of disposing of human waste
Making a "cat hole" or using a latrine

64. List at least two methods for personal cleanliness
Bathing with water using the best environmental control (bathing with water away from the water source and, if there no other way, take an "air bath."
65. Describe a good way to build a fire in the wilderness
 - a) **Make three piles of fire materials: tinder, kindling and sustaining fuel.**
 - b) **Construct the fire using a design that will work in your situation: Teepee Fire, Pyramid Fire, Star Fire, Dakota Hold Fire, etc.**
66. What is the proper use of a whistle when signaling?
Blowing it repeatedly while stopping to listen
67. Describe how to construct a cat hole
Make at least 200 feet from campsite, trail or water source. Dig a hole about six inches deep but no deeper than the topsoil,
68. List at least five safety rules for lightening protection
 - a) **Stay indoors if possible,**
 - b) **Do not use the telephone,**
 - c) **Get out of the water and small boats,**
 - d) **Where there is no shelter avoid the highest point in the area,**
 - e) **Stay in away from trees, etc.**
69. List at least four hazards of urban search & rescue
 - a) **Collapsing buildings,**
 - b) **Live electrical wires,**
 - c) **Nails and glass,**
 - d) **Natural gas leaks, etc.**
70. Hypothermia
The medical condition of heat loss that is caused by the body's inner temperature to be lowered so far below normal that the person becomes ill. A person is considered hypothermic when their core temperature is below 95 degrees F.
 - a) **The causes can be such things as falling into cold water, exposure to cold weather while wet, improper dress, etc.**
 - b) **Symptoms include complaining of being cold, shivering, loss of muscular coordination, inability to keep up with others, etc.**
 - c) **Prevention is directed at reducing heat loss and increasing heat production. Treatment includes getting the victim into a warm environment and replacing wet clothing with dry clothing**
71. Frostbite
Frozen tissue is caused by exposure of tissue to cold temperatures. Pain is an early symptom of frostbite. As the tissue freezes the pain will disappear and the only symptom maybe the lack of feeling in that area. The effected area may turn pale or white. It prevents limiting exposure and keeping the body extremities properly insulated. Treatment in the field includes removing any constrictive clothing,

elevating the injured area during transport, not allowing the injured person to walk on a frostbitten foot or use a frost-bitten hand

72. Trench Foot or immersion foot injuries

Usually caused by feet being immersed or directly exposed to water/moisture for an extended period.

- a) Symptoms include red skin, very tender feet, swollen and itchy feet.**
- b) It is prevented by keeping feet dry and warm,**
- c) It is treated by removing the feet from the environment and warming the feet**

73. Heat Cramps

Heat cramps are muscle pains usually caused when a person exercises in environments of high temperature and humidity to the point of profuse sweating and salt depletion.

- a) Symptoms include sudden cramping of the lower extremities and or abdomen.**
- b) Prevention can include periodic resting and the ingestion of drinks such as Gatorade.**
- c) Treatment includes rest, water and salt replenishment**

74. Heat Exhaustion

Is the more severe response to the same environment that causes heat cramps. It affects the whole body.

- a) Symptoms are headaches, fatigue, dizziness, nausea & cramping, with the person usually sweating profusely while the skin is cool to the touch.**
- b) Treatment is usually the same as with heat cramps. However, in severe cases, intravenous fluids may be required**

75. Heat Stroke

Is the severe disturbance in the body's heat regulating mechanism and is considered life threatening.

- a) Symptoms may include failure of the body's sweating mechanism with the body temperature increasing rapidly. The skin is hot, reddened and dry. The person will have a strong pulse. The person may experience headache, dizziness, dry mouth, seizures and coma.**
- b) Treatments include lowering the body's temperature by immersing the body in cool water (making sure not to cause shivering), applying cold packs to pulse points, spraying water on the person while fanning, etc.**

76. Dehydration

Is the condition of the body losing water caused by not replenishing the body's water by drinking.

- a) Symptoms include thirst (except at high elevations where thirst may be absent, fatigue, weakness, lightheadedness.**
- b) Treatment includes rest and consumption of liquids. A person with severe dehydration will have a dry mouth & eyes and "loose" skin**

77. Blisters

Are fluid-filled pockets under the surface of the skin that are caused by friction.

- a) Prevention includes using properly fitted foot gear and by always wearing two pairs of socks.**
- b) Treatment is to not rupture the blister, if possible and by applying enough layers (such as with the use of moleskin) to keep pressure off of the blister**

78. Snake Bites

(Cause and symptoms are obvious)

- a) Prevention measures include watching where you place your feet, stepping on top of obstacles (such as logs) rather than over them, being alert, inspecting a spot before sitting down, etc.,**
- b) If bitten, immobilize the area. The victims should not be moved more than necessary. A more controversial method is applying suction to the bite and the use of constricting bands**

79. Insect Bites

The cause can be any number of several types of insects,

- a) Symptoms can include something as mild as itching or hives, rash, swelling, difficulty in breathing, unconsciousness, etc.**
- b) Prevention is through the proper use of clothing and repellants and by avoiding the use of perfumes, colognes, and deodorant soaps before going out in the field.**
- c) Treatments depend on the bite and may include removing a stinger, cleaning the area, treating allergic reactions, etc.**

80. Tick Bites

If you know or suspect that you have been bitten by a tick, remove the tick carefully and disinfect the site of the bite.

- a) Prevention includes the proper use of clothing and repellants and through inspection of the body**

81. Poisonous Plants

a) Symptoms include irritation to the skin, rashes & itching.

b) Prevention is through avoidance and proper use of clothing, etc. Treatment includes the use of special soaps and lotions

82. What is the importance of an adequate pack in SAR?

- a) Prepared for a minimum of situations**
- b) Possibly staying in the field overnight,**
- c) Being able to administer first aid, etc.**

83. List the general contents of a 24-hour pack

First aid kit, clothing, shelter material, water, personal safety gear (whistle, flashlight, etc.), general SAR equipment (compass, flagging, paper and pencil, etc.), improvisational tools (knife, plastic bag, rope, etc.)

84. Ground Pads
Provides insulation, but will add weight
85. Sleeping bags
Will provide warmth, but adds weight. Must be the correct type for the environment
86. Shelters(tents)
Provide protection from the elements, but adds weight
87. Water Containers
Must have adequate supply, but can add a lot of weight
88. Boots
Must have, but they must fit properly and be comfortable
89. Walking Stick
Can help you keep your balance as well as having a number of other uses (tracking, poking in debris. Some people don't like them as they can be a little cumbersome to carry
90. Flashlight/headlight
Both have obvious advantages, but a possible disadvantage can be with becoming too dependent upon one when your eyes, if given time to adjust, might work fine
91. Knife
Best is a multi-purpose tool. Requires careful use
92. Be able to differentiate between at least three types of maps:
a) **Maps show the shape and elevation of terrain while showing graphic representation of selected man-made and natural features.**
b) **Pictorial maps are an artist's conception of an area based upon topographical survey.**
c) **Aerial photographic maps are simply a photograph taken from the air.**
d) **Planimetric maps are the basic road maps that we are all familiar with**
93. List five topographical map symbols know what they represent
Hard surface roads., dirt/gravel roads, trails, power lines, railroad tracks, mine or quarry, marsh, etc.
94. Contour Lines
Show general terrain shape and steepness. Each line represents a certain altitude above sea level
95. True North vs. Magnetic North
a) **True North is at the very top of the earth,**
b) **Magnetic North is where the needle of a compass will point to**
96. Declination
The difference, in degrees, between True North & Magnetic North

97. Define the Geographic Coordinate System
This is the system that incorporates the use of grid systems using latitude and longitude. Latitude lines are parallel to the equator, while the longitude grid lines intersect the poles.
98. Define Universal Transverse Mercator System
A grid system based on metric measurements
99. Define SDMRTS
San Diego Mountain Rescue Team System. An easy system of navigation that simply uses measuring (with a ruler, etc.) the distances to a point on a map from the margins of the map
100. List at least five types of operational resources that may be used in SAR
Dogs, "man trackers", Civil Air Patrol, HAM radio operators, Snowmobile clubs, ATV clubs, Red Cross, etc.
101. The main motivation for SAR workers should be what?
Reduce pain and suffering for a missing or injured person
102. What are the "Crucials" that summarize the minimum knowledge requirements for effective searching?
**a) The search is an emergency
b) The search is a classic mystery,
c) Search for clues as well as the subject(s),
d) Concentrate on aspects that are important to success and are under your control,
e) Know if the subject leaves the search area
f) Use close spaced grid searching as a last resort)**
103. POA
Probability of area: the chance that the subject or clues are in the area being searched
104. POD
Probability of Detection: the chances of finding the person or clues given that they are in the area being searched
105. POS
Probability of Success. $POA + POD = POS$
106. PLS
Point Last Seen: a general area
107. LKP
Last known point: a specific area
108. Explain the need for practicing POD estimation at the crew level
This information can be of crucial importance if you are asked to give it as part of a debriefing. In addition, this information helps to determine where to look next

109. Explain the difference between passive searching and active searching
Passive searching uses tactics that do not involve physically looking for the subject or clues. Active searching uses active methods of searching
110. List three passive and three active search tactics
a) **Passive: Investigation, confinement, attraction**
b) **Active: Hasty, efficient, thorough**
111. Hasty search
Is a fast initial response of mobile searchers that check areas most likely to produce clues or the subject (Also called a TYPE I search)
112. Efficient search
Is a relatively fast systematic search of high probability segments of a search area (Also called a TYPE II search)
113. Thorough search
Is a slow systematic search using the most thorough techniques to provide the highest POD (Also called a TYPE III search)
114. Attraction
An action is taken to attract the subject to a desired location. Examples would be blowing a whistle, honking a horn (etc.) and listening and looking for a response
115. Confinement/Containment
Involves efforts to confine the movement of a lost subject. An example would be to use roadblocks
116. Sign Cutting
Sign cutting looks for evidence of passage. Unlike tracking, sign cutting is done perpendicular to the direction of travel of the person being followed
117. Open Line or Open Grid Searching
This is used in Efficient type searches and uses wide spacing between the searchers. There is no overlap of searchers
118. Closed Line or Closed Grid Searching
Used in Thorough type searches and incorporates close-spaced grid searching with overlapping. String lines or something similar are almost always used
119. Tracking
Involves following the signs (evidence) or tracks left by someone or something
120. Control Line
A line, perpendicular to the direction of travel, on which searchers line up in a grid search
121. Guideline
A line, parallel to the direction of travel that the search team follows to guide a grid search

122. Guide right/left

The direction in which a searcher hooks for guidance as to the status of the control line

123. Guide Person

The person on which the search team guides. This person is usually found at one end of the control line

124. Trail Tape/Ribbon. String Line

Material that can be used to indicate a line when no natural line exists

125. What are the four procedures for documenting evidence?

- a) Photograph,**
- b) Sketch,**
- c) Preserve,**
- d) Describe (taking notes)**

126. Describe the considerations for handling a crime scene:

- a) Proceed with caution, looking for evidence of electric wires, spilled fuel, etc.**
- b) Prevent further injury to the victim(s),**
- c) Determine if the subjects are alive or dead,**
- d) Handle evidence as determined in the mission briefing,**
- e) Document/photograph all pertinent evidence,**
- f) Injured persons should be treated first,**
- g) Dead bodies should be left in place**

127. Explain why SAR personnel search for clues, not subjects

There are many more clues than subjects, and it is the detection of clues that can reduce the search area

128. Describe the elements of clue orientation theory and describe the procedures used upon locating a clue

Subject: Having information on the subject enables searchers to relate a particular clue to the subject or discount it altogether

Clues: These provide at least four messages:

- a) The present location of the subject,**
- b) The previous location of the subject,**
- c) The destination of the subject**
- d) A total lack of any clue,**
- e) All clues should be placed on a time continuum to better reconstruct the incident.**

Search area:

- a) The search area must include all of the clues.**

Search Tactics: Use different tactics to eliminate areas from the search.

129. List searcher preplanning and preparation procedures

The following:

- a) Know what is expected of you,**
- b) Understand what is necessary to perform the mission,**
- c) Have the proper equipment and know how to use it,**
- d) Be physically and mentally prepared**

130. List the information needed by the searcher when alerted of a search

Weather, terrain, special equipment needed, meeting place, etc.

131. Checking in

Checking in: Follow the formal check-in procedure as required by your unit.

132. Crew Mission Briefing

This is a summary of the situation, and all searchers must be briefed before being deployed, This is the time to ask questions, take notes, get a map, get copies of appropriate information, etc.

133. Crew Mission Debriefing

The team leader may debrief his/her team and then, in turn, be debriefed. Debriefing should be done on an individual basis and should be done in writing. The ultimate responsibility lies with the ICS system

134. Checking out

Follow the established procedure. This is very important so that every searcher can be accounted for

135. Team Leader or Search Crew Leader

Is in charge and responsible for the actions of his/her team.

136. Radio Operator

Is responsible for communication between the team, base camp, and other units.

137. Navigator

Responsible for the navigation of the team

138. Pacer

If pacing is used, this person determines and records distances.

139. Search Crew Member

Searches

140. Why is knowledge of lost person behavior important?

Such understanding can greatly enhance the chances for a successful search

141. Track or Print

The impression left from the passage of a person

142. Sign Cutting

Is an organized technique of looking for sign or evidence in order to establish a starting point from which to track

143. Sign

All evidence left by the subject

144. “Step-by-Step” tracking

A disciplined tracking system where a tracker sees each step in sequence and proceeds no further than the last visible track

145. List two materials used in making rope

Nylon, polyester, polypropylene, Technora, etc.

146. List at least two types of design used in rope manufacturing

Laid, braided, double-braided, Kernmantle

147. Dynamic Rope

Rope that will stretch to absorb shock. Used for climbing and mountaineering

148. Static Rope

Rope that stretches very little. Used for descending, ascending, and litter movement

149. Fall Factor

Is a measure of fall severity that is calculated by dividing the distance the person attached to the rope will fall by the length of the rope between him and the rope anchor or belay

150. Maximum Load

The total weight that the rope will be holding in a situation

151. Lifeline

Is rope used to support life and is usually new or in very good condition. Certain exact conditions must be met before a rope can be considered to be a lifeline

152. Tubular Webbing

Webbing that is manufactured as a tube. It is more resistant to abrasion than flat webbing

153. Flat Webbing

Is manufactured flat, like a seatbelt

154. List at least five rules of rope etiquette

- a) Never step on or drag a rope,**
- b) Do not leave the rope under tension,**
- c) Do not leave any knots in the rope,**
- d) Avoid kinking,**
- e) Wash as necessary,**
- f) Keep a use log, etc.**

155. List two performance standards of a harness

- a) It should be strong,**
- b) Secure,**
- c) Easy to adjust,**

d) Should allow for free movement, etc.

156. List the advantages and disadvantages of materials used in carabineers

- a) Steel: stronger but heavier than aluminum. Wears much longer but could rust.**
- b) Aluminum: not as strong as steel, causes slightly more friction, but is lighter in weight, and costs less**

157. List the functions of at least two different types of carabineers

- a) Non-Locking have a spring-loaded gate but have no special means of assuring that they do not open at an undesirable time.**
- b) Locking carabineers have a locking mechanism to ensure that they do not come open accidentally. Their common use is with rescue**
- c) Auto-locking carabiners take two actions to open them, but when gate is released they automatically lock. Common use is personal safety**

158. Describe the care of carabineers

- a) They should be cleaned when they become dirty.**
- b) Retire the piece when the gate becomes difficult to operate.**
- c) Take any carabineer out of service that has sustained a fall from a height onto a hard surface**

159. List the advantages & disadvantages of at least two different types of litters

- a) Stokes Wire Basket Litter: This design allows for a patient to be packaged in such a way as to offer support that would allow the patient to be carried in a variety of ways, but, will not slide over ground or snow easily.**
- b) "FERNO" Basket litter: Similar to a Stokes but is made of composite material and slides easily over surfaces**
- c) The Army stretcher: Consists of two long poles that support a canvas bed.**

160. List at least five practical skills needed by field searchers.

- a) Radio operations,**
- b) Search tactics,**
- c) Land navigation,**
- d) Emergency medical care,**
- e) Interviewing,**
- f) Tracking,**
- g) Low angle rescue,**
- h) Survival training, etc.**

161. Describe the function and duties of a helicopter observer

The observer is the individual that usually sits next to the pilot and is charged with helping and relieving the pilot of certain visual duties so that the pilot can concentrate fully on flying the helicopter. The observer will serve as the searcher and will help identify hazards to the pilot

162. List at least ten safety rules for personnel during helicopter operations

- a) All personnel must approach or leave the helicopter from the front.**

- b) No smoking within 100 feet of any helicopter,**
- c) Personnel should wear safety helmets and approved clothing**
- d) Ropes should be coiled and secure as well as any loose items,**
- e) Passengers should not enter the helicopter until the pilot gives the signal,**
- f) When approaching a helicopter, keep one's head down as the slower the rotor is moving, the lower the blades will dip,**
- g) Never approach or leave a helicopter where the ground is higher than it is where the helicopter is sitting,**
- h) During take-offs and landings all ground personnel should stay well away from the helicopter,**
- i) Advise the pilot of any obstruction nearby, do not assume that the pilot sees it,**
- j) do not touch anything without absolute permission**

163. List at least five procedures in establishing a heli-spot

- a) Find an area well large enough for landing and take-off, with at least a fifteen-degree approach and take-off angle.**
- b) Try to find a landing zone that is orientated with the long axis into the wind.**
- c) Clear the landing area of all obstacles higher than one foot,**
- d) Mark landing zones correctly,**
- e) Use proper hand signals to assist the pilot in landing**

164. List at least five radio procedures and guidelines

- a) Keep the antenna pointed up,**
- b) Make sure that line is clear of others talking,**
- c) Press the push-to-talk button and pause before speaking,**
- d) Don't shout,**
- e) Use 24 hour (military time),**
- f) Be brief,**
- g) Speak slowly**

165. Give the titles and explain the duties of Command and General Staff members

Command Staff refers to:

- a) Incident Commander is in overall charge.**
- b) Liaison Officer is the primary contact in larger incidents that involve multiple agencies.**
- c) Safety Officer monitors safety conditions and develops measures for assuring the safety of all personnel.**
- d) Public Information Officer is the point of contact for the media.**

The General staff include:

- a) Operations Section Chief,**
- b) Planning Section Chief,**
- c) Logistics Section Chief**
- d) Finance/Administration Section Chief**

- 166.** Describe the terms used to name major incident facilities and state the function of each
- a) Incident Command Post:** The location from which the IC oversees all incident operations.
 - b) Staging Areas:** Are temporary locations at which resources are kept while awaiting incident assignments.
 - c) Incident Base:** Is the location at the incident at which primary service and support activities are performed.
 - c) Camps:** Are temporary incident locations which equipped and staffed to provide sleeping, food, water, and sanitary services to incident personnel, d) Heli-base: A location at which helicopters may be staged
- 167.** Describe what an Incident Command Plan is and how it is used
- Every incident must have an oral or written action plan. Its purpose is to provide all incident supervisory personnel with direction for future action. The essential elements of IC Plan are:**
- a) A statement of objectives,**
 - b) Organization,**
 - c) Assignments to accomplish the objectives and d) Supporting material**
- 168.** Describe span of control and its functions
- The span of control refers to the number of individuals one supervisor can effectively manage. It functions by making sure that no single supervisor has normally no more than five organizational elements or five people under their immediate control.**
- 169.** Describe the common responsibilities associated with incident assignments
- These common responsibilities include**
- a) Receive your incident assignment from your organization.**
 - b) Bring any specialized supplies or equipment required for your job.**
 - c) Upon arrival, check in.**
 - d) Radio communications should use clear text, no radio codes.**
 - e) Obtain a briefing.**
 - f) Acquire necessary work materials.**
 - g) Organize and brief any subordinates assigned to you.**
 - h) Brief your relief person at the end of each operational period.**
 - i) Complete any required forms.**
 - j) Demobilize**
- 170.** List and describe the Three Lines of Defense in protecting your body from the rigors of the outdoors
- a) Clothing:** the clothing that you are wearing is your first line of defense.
 - b) Your next line of defense is from man-made objects or structures and things derived from them. Examples are": buildings & other protective structures and things in them—upholstery, paper, foam rubber, etc.**

c) The last line of defense is improvised clothing from the natural environment. Examples would be snow blocks, leaves, boughs or any natural material that will provide more insulation for your clothing or to a shelter

171. List at least three safety rules or procedures used in rural SAR

- a) Technical personnel should be used for technical rescue.**
- b) If the subject is deceased, evacuate only if, and when there is no risk to fellow team members, or, at least, when the hazards have been assessed and justified.**
- c) Stabilize the subject before evacuation, if possible; and continue this during the transport.**
- d) Decide on the easiest route before traveling.**
- e) Litter teams should be used no more than twenty minute shifts, etc.**

172. List some of the factors that contribute to survival situations in SAR missions

- a) Improper clothing and/or foot gear.**
- b) Fatigue,**
- c) Dehydration,**
- d) Hypothermia or hyperthermia.**
- e) Too ambitious an undertaking.**
- f) Poor physical conditioning and/or lack of motivation.**
- g) Inadequate or improper food.**
- h) Little or no planning.**
- i) Inadequate team to meet the goal and lack leadership.**
- j) Itinerary confusing or not known to others.**
- k) Not recognizing a physical, mental or environmental threat.**
- l) Poor preparation for adverse weather.**
- m) Unfamiliarity with terrain and no map or compass.**
- n) "It can't happen to me" philosophy**

173. List three advantages and disadvantages of using a GPS unit during search operations

Advantages:

- a) It is very quick and easy to locate your position.**
- b) Allows for the setting of points that may be needed later for a variety of reasons.**
- c) Displays distance & bearing to a waypoint.**
- d) Displays velocity of travel.**
- e) May show altitude, etc.**

Disadvantages:

- a) Requires line-of-sight to satellites and may not work in all terrains.**
- b) Human error is always a possibility.**
- c) Are not always perfectly accurate and reliable.**
- d) Must be set up properly in respect to settings, etc.**

174. List five types of operational resources that may be used in SAR tell what the advantages and disadvantages are of each:

Human trackers, dogs, horses, helicopters, ATV's.' Snowmobiles, hasty teams, grid search teams, interviewers, communications equipment, etc.

175. Describe how to use the ESAR Grid Naming System

The system consists of a number-word-number sequence. The first number describes the number of searchers on the grid or control line. The team leader is not included in this figure if he or she is working behind or off the control line. The word is either "compass" or "guide" and indicates what the team is guiding on. The word is "compass" if the team is using a compass bearing for directional control. The word is "guide" if the team is guiding on a string line, creek, road or anything other than a compass. The word "right" or "left"? can be added after the word "guide" to indicate which way the control line should guide. The second number in the system describes the average distance between searchers in feet. Example: "5 - guide right - 40 ". This describes a search by five members on the control line, that is guiding on something to the right, and has an average spacing of 40 feet

176. Describe at least five parts of the compass and demonstrate its use to plot a course on a map

The student will be able to describe at least five parts of the compass and demonstrate its use to plot a course on a map

- a) **Base plate**
- b) **Bezel or dial**
- c) **Bearing line**
- d) **Magnetic needle**
- e) **Direction of travel needle**
- f) **Index line**
- g) **Sighting mirror**
- h) **Gride lines**

177. Demonstrate the following navigational functions

- a) **Orientating a map and compass to the terrain.**
- b) **Obtain & follow a simple compass bearing.**
- c) **Be able to get a back bearing.**
- d) **Be able to measure distance by pacing**

178. Take a bearing in the field and transfer it correctly to the map and obtain a bearing on the map and transfer it correctly to the field

The student will be able to take a bearing in the field and transfer it correctly to the map and obtain a bearing on the map and transfer it correctly to the field

179. Demonstrate the UTM grid system to determine the coordinates for a given point

The student will be able to demonstrate the UTM grid system to determine the coordinates for a given point

180. Understand and use the Range and Township system

The students will understand and use the Range & Township system

181. Describe and demonstrate the following search techniques

- a) Hasty search (Type I),**
- b) Efficient search (Type II),**
- c) Thorough search (Type III),**
- d) Sign cutting,**
- e) Tracking,**
- f) Open line search (spacing over 100 ft),**
- g) Route search,**
- h) Azimuth search**

183. Describe the considerations for handling evidence associated with crash scenes, dead bodies, and injuries

The student will be able to describe the considerations for handling evidence associated with the following situations: crash scenes, dead bodies, injuries

184. Know the general guidelines for skilled searchers

General guidelines for skilled searchers:

- a) Proper attitude**
- b) Searcher safety**
- c) Personnel accountability**
- d) Be prepared**
- e) Using the searcher “cube”**
- f) Use all senses**
- g) Search for clues and subjects**
- h) Use sound and listen**
- i) Know your surroundings**
- j) Always check the obvious**
- k) Dealing with media**
- l) Scanning**
- m) Encountering illegal activities**
- n) Searcher fatigue**

185. Describe the concept and use of Critical Spacing as a search tool

The student will be able to describe the concept and use of Critical Spacing as a search tool

186. Demonstrate the process of estimating POD during search operations

The student will be able to discuss the effectiveness of their sensors to detect clues etc.

187. List and demonstrate searcher preplanning and preparation procedures

The student will be able to list and demonstrate searcher preplanning and preparation procedures

188. Describe and demonstrate the following procedures in the use of a litter

The student will be able to describe and demonstrate the following procedures in the use of a litter.

- a) Patient packaging**
- b) Lifting,**
- c) Lowering**
- d) Carrying techniques.**
- e) Litter crew procedures and commands**

189. Describe the basic legal philosophy concerning searcher knowledge, training, physical abilities, equipment, discipline, and control

The student will be able to describe the basic legal philosophy concerning searcher knowledge, training, physical abilities, equipment, discipline and control